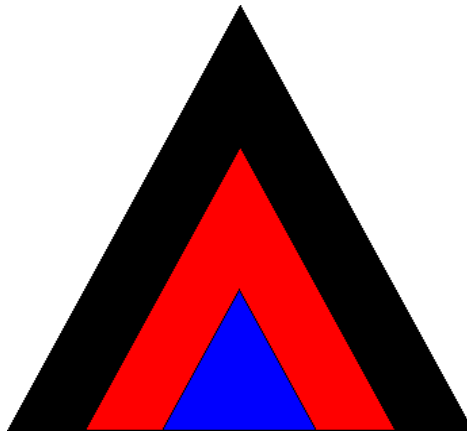


CDS130 Final exam (PART II)

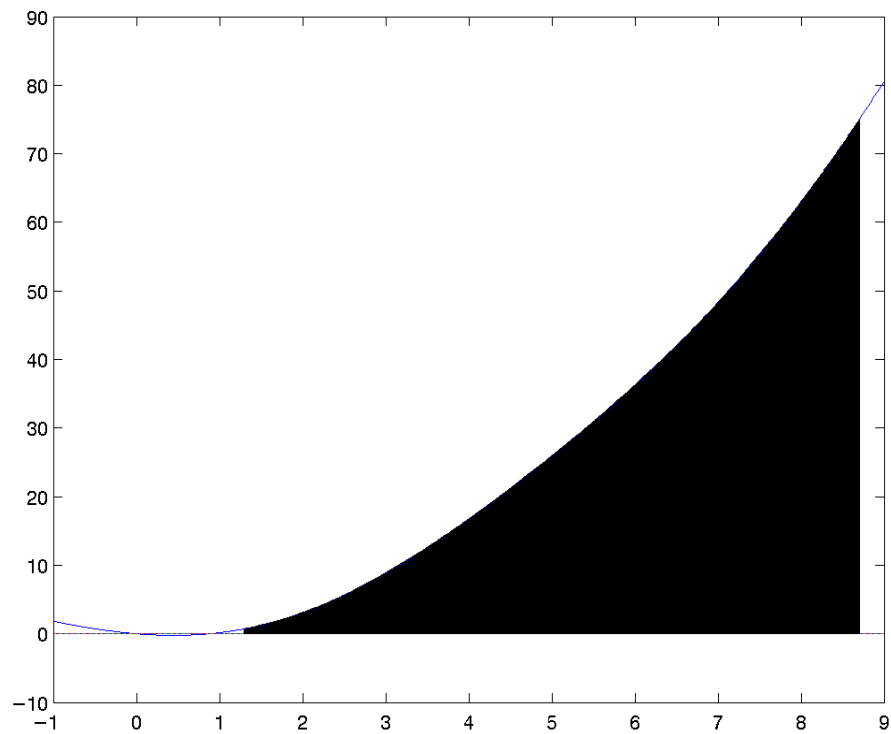
The final exam consists of two sections. The first section is a closed-book paper exam (60 minutes); and the second section involves use of Matlab on the computer (60 minutes). The following part is the section section of the exam.

- You are required to use Matlab to solve the problems.
- Absolutely no interaction between students is allowed.
- Partial credit may be awarded ONLY if work is shown.
- Duration for this section: 60 minutes (8:30 am – 9:30am).

Q1. (10 points) Write a Matlab script to create an image as follows:



Q2. (10 points) Given a mathematical function $f(x) = x^2 - \sin(x)$, calculate the area underneath the curve from $x=1.3$ to $x = 8.7$. (Provide both the code and the final answer)



Q3. (10 points) Write a matlab code to compute the following math. Provide your mable code for the computation.

$$\frac{1}{1 \times 3} + \frac{1}{5 \times 7} + \frac{1}{9 \times 11} + \dots + \frac{1}{9999 \times 10001}$$

Q4. (10 points) Write a MATLAB code that draws a 8-by-8 checkerboard with red and black tiles.

Q5. (10 points) Use the following code to generate a black and white picture. Provide a matlab code to (1) change the white area in the figure to the red color, and (2) show the image.

```
clear all; clc;
M = imread('http://cds130.org/wiki/images/Iregular.jpg');
[X, map] = rgb2ind(M, 2); % the image matrix contains two colors only.
image(X);
colormap(map)
```